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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,517	03/05/2002	Claude Jaussaud	220040US2PCT	9383

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EXAMINER

GUERRERO, MARIA F

ART UNIT PAPER NUMBER

2822

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,517

Applicant(s)

JAUSSAUD ET AL.

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the Amendment filed March 16, 2006.

Status of Claims

2. Claims 1-22 are canceled. Claims 23-31 are pending.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

4. Claim 31 is objected to because of the following informalities: claim 31 recites: depositing at least one layer onto directly on the face of the first semiconductor film element, each material chosen for each **conductive** layer being either a semiconductor material or a metallic material. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 23-24 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Merchant et al. (U.S. 6,118,181).

6. Merchant et al. teaches a method of creating an electrically conducting bonding between a face of a first semiconductor element and face of a second semiconductor element by heat treatment (Abstract). Merchant et al. discloses depositing at least one layer of material (a semiconductor material or a metallic material) on the face of the first semiconductor element and at least one layer of material on the face of the second semiconductor element; wherein one of the layers is deposited with an excess thickness (Fig. 1A, col. 3, lines 30-66).

7. Furthermore, Merchant et al. teaches applying the faces one against the other (pressing) with interposing of the deposited layers and carrying out a heat treatment the layers to form a layer that provides electrically conducting bonding between the two

faces (Fig. 1B, col. 3, lines 45-66, col. 4, lines 1-30). Merchant et al. shows no insulator layer being interposed between the two faces such that the semiconductor film is not electrically insulated from the first semiconductor element (Fig. 1B).

8. In addition, Merchant et al. teaches reacting the layers of material in a solid phase during heat treatment to form a temperature stable mixture with respect to the first and second semiconductor elements (col. 3, lines 45-66, col. 4, lines 1-30). Merchant et al. discloses not inducing any reaction product between the deposited layer of material and at least one of the semiconductor elements during the heat treatment (Fig. 1A-1B, col. 4, lines 1-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 25 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merchant et al. (U.S. 6,118,181) in view of Goesele et al. (U.S. 5,877,070) and Linn et al. (US 5,387,555).

10. Merchant et al. teaches a method of creating an electrically conducting bonding between a face of a first semiconductor element and face of a second semiconductor element by heat treatment (Abstract). Merchant et al. discloses depositing at least one

layer of material (a semiconductor material or a metallic material) on the face of the first semiconductor element and at least one layer of material on the face of the second semiconductor element; wherein one of the layers is deposited with an excess thickness (Fig. 1A, col. 3, lines 30-66).

11. Furthermore, Merchant et al. teaches applying the faces one against the other (pressing) with interposing of the deposited layers and carrying out a heat treatment the layers to form a layer that provides electrically conducting bonding between the two faces (Fig. 1B, col. 3, lines 45-66, col. 4, lines 1-30, col. 5, lines 25-30). Merchant et al. shows no insulator layer being interposed between the two faces such that the semiconductor film is not electrically insulated from the first semiconductor element (Fig. 1B).

12. In addition, Merchant et al. teaches reacting the layers of material in a solid phase during heat treatment to form a temperature stable mixture with respect to the first and second semiconductor elements (col. 3, lines 45-66, col. 4, lines 1-30). Merchant et al. discloses not inducing any reaction product between the deposited layer of material and at least one of the semiconductor elements during the heat treatment (Fig. 1A-1B, col. 4, lines 1-30). Merchant et al. also shows using titanium or other suitable elements as one of the layers deposited on the surface to be bonded (col. 3, lines 50-60).

13. Merchant et al. is silent about depositing tungsten to form the mixture comprising WSi_2 . Merchant et al. does not specifically show the oxide being in a form of isolated precipitates. However, Linn et al. teaches the interposed layers comprising a layer of

tungsten and a layer of silicon that could be on one of or both faces (col. 8, lines 20-25). Linn et al. teaches forming WSi₂ during the heat treatment (Fig. 5b, col. 7, lines 3-15). Linn et al. teaches forming at least one oxide layer onto at least one of the deposited conductive layers and the oxide reacts such that the oxide formed is in a form of isolated precipitates that do not substantially harm the electrically conducting bonding (Fig. 5a-5b, col. 6, lines 58-67, col. 7, lines 1-28).

14. Merchant et al. is silent about the semiconductor element being SiC. However, Goesele et al. shows the use of SiC in the bonding process as conventional in the art (col. 3, lines 50-60, col. 6, lines 15-16).

15. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Merchant et al. reference by including the use of SiC as taught Goesele et al. and the use of tungsten and the oxide layer as taught by Linn et al. because Merchant et al. suggested that other suitable elements may be used and would provide better stress compensation and less contamination (Linn et al., col. 2, lines 60-68).

16. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merchant et al. (U.S. 6,118,181) in view of Doyle et al. (U.S. 6,423,614).

17. Merchant et al. does not specifically show the step of preliminary defining the semiconductor film as a layer configured to be detached. Merchant et al. does not specifically show step of forming microcavities by ionic implantation through the face of the semiconductor element. However, Doyle teaches defining the semiconductor film as

Art Unit: 2822

a layer configured to be detached and forming the thin film on the substrate by forming microcavities using ionic implantation (Fig. 3-12, col. 3, lines 3-65, col. 6, lines 5-45).

18. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Merchant et al. reference by including the steps of forming the thin film on the substrate by forming microcavities using ionic implantation as taught by Doyle in order to obtain an integrated circuit with a second level of transistors with competitive performance at lower cost (Doyle, col. 2, lines 5-10).

Response to Arguments

19. Applicant's arguments filed March 16, 2006 have been fully considered but they are not persuasive. Claims 23-31 stand rejected because the amendment does not overcome the rejections in view of Merchant et al. The rejections in view of Malhi have been withdrawn.

20. Applicant argued that the annealing temperature used in Merchant to create a bond between two layers, is not sufficient to carry out a heat treatment for combining the deposited layers to form a layer. However, Merchant et al. teaches carrying out a heat treatment of the layers to form a layer that provides electrically conducting bonding between the two faces (Fig. 1B, col. 3, lines 45-66, col. 4, lines 1-30, col. 5, lines 25-30). In addition, the claims are silent about the temperature during the heat treatment.

21. Applicant's arguments with respect to the thin oxide layer with a thickness of a few angstroms have been considered. However, there is not evidence of criticality or unexpected results. The applicant must show that the particular range is critical,

Art Unit: 2822

generally by showing that the claimed range achieves unexpected results relative to the prior art range. In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 -§716.02(g) for a discussion of criticality and unexpected results.

22. Furthermore, during examination, the claims must be interpreted as broadly as their terms reasonably allow. > In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)(The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must give claims their broadest reasonable interpretation.) < This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) >; Chef America, Inc. v. Lamb-Weston, Inc., 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004). Therefore, words in the claims have been given their plain meaning because applicant has failed to provide any special definition in the specification.

23. In addition, "the use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain." In re Heck, 699 F.2d 1331, 1332-33, 216 USPQ 1038, 1039 (Fed. Cir. 1983) (quoting In re Lemelson, 397 F.2d 1006, 1009, 158 USPQ 275, 277 (CCPA 1968)). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also

Art Unit: 2822

Celeritas Technologies Ltd. v. Rockwell International Corp., 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir.1998).

24. Finally, the transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., > Invitrogen Corp. v. Biocrest Mfg., L.P., 327 F.3d 1364, 1368, 66 USPQ2d 1631, 1634 (Fed. Cir. 2003) ("The transition comprising' in a method claim indicates that the claim is open-ended and allows for additional steps."); < Genentech, Inc. v. Chiron Corp., 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("Comprising" is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); In re Baxter, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); Ex parte Davis, 80 USPQ 448, 450 (Bd. App. 1948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts").

Conclusion

25. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

Art Unit: 2822


mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

May 22, 2006


MARIA F. GUERRERO
PRIMARY EXAMINER